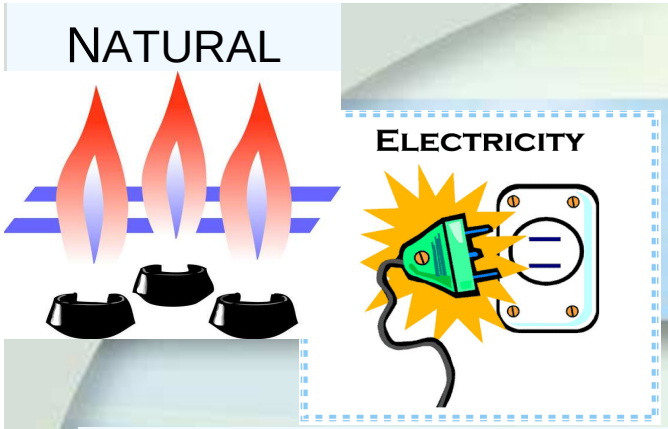
AB 32 Implementation Update: The Energy Sectors (Electricity and Natural Gas)

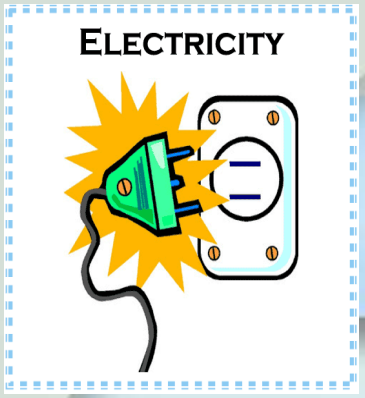
California Air Resources Board

April 24, 2008

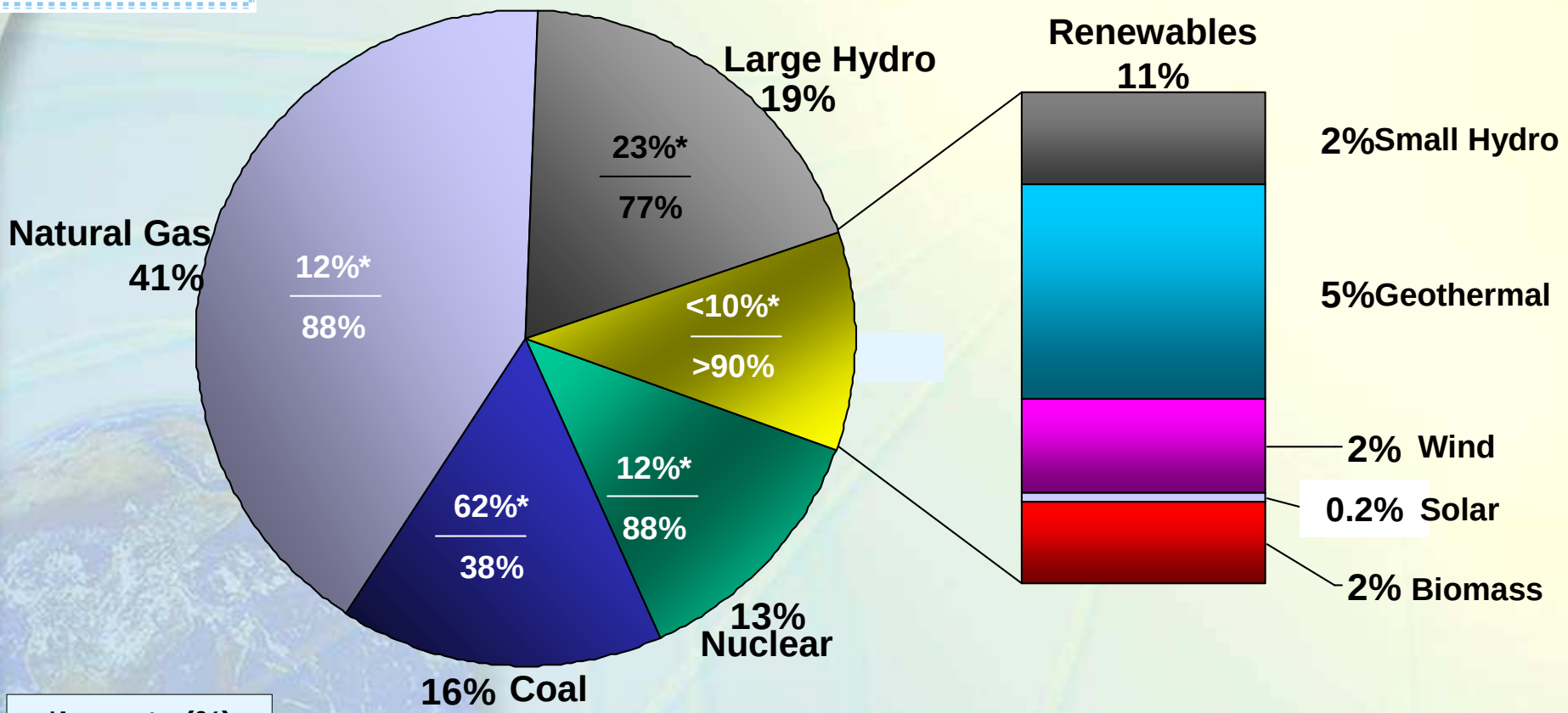


Sector Profile: Electricity & Natural Gas

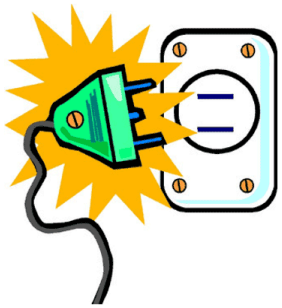
- Electricity Sector
  - Fossil-fired power plants (in State and imports)
  - Large hydroelectricity
  - Nuclear
  - Renewables (small hydro, wind, solar, biomass, geothermal)
  - Cogeneration
- Natural Gas Sector
  - Residential and commercial combustion
    - Space heating, cooking, and hot water



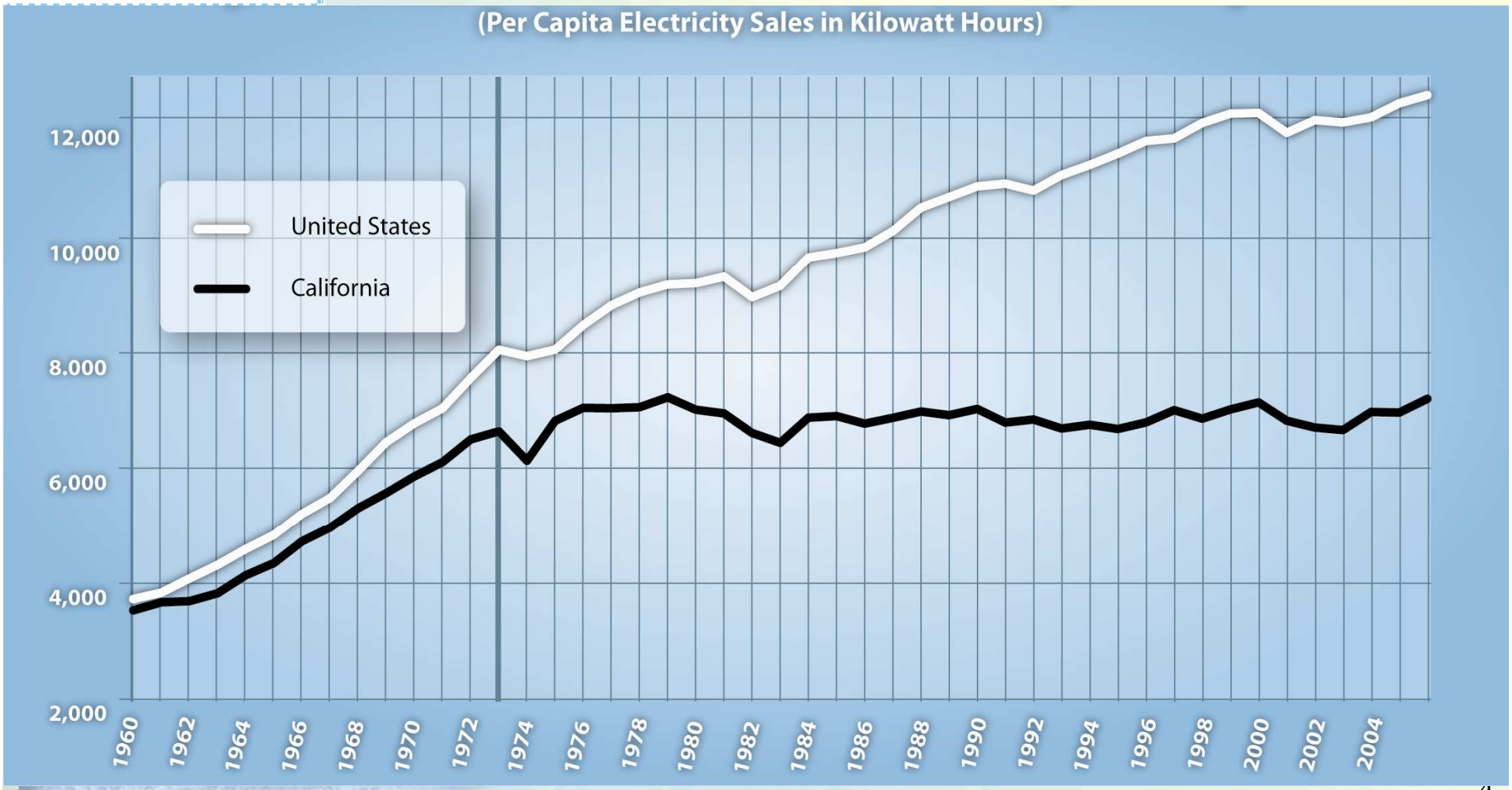
California's Electricity Mix (2006)



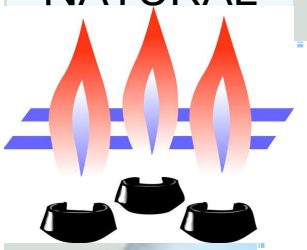
ELECTRICITY



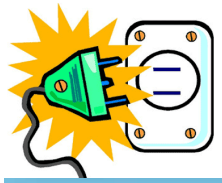
Per Capita Electricity Use in California and the US



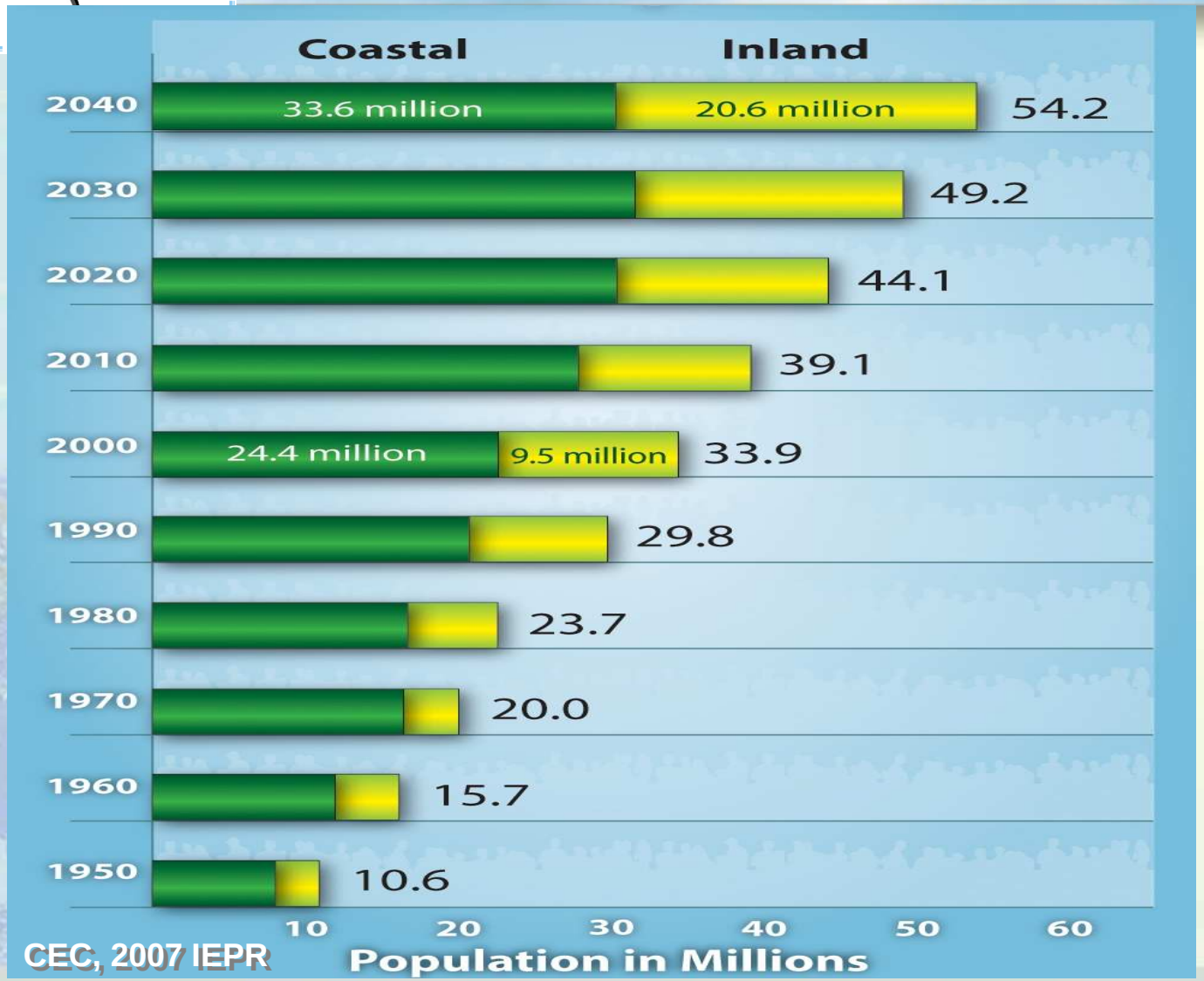
NATURAL



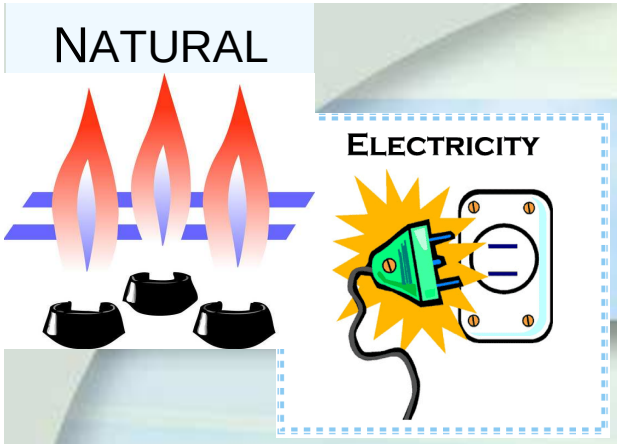
ELECTRICITY



Inland Growth Will Spur Peak Demand

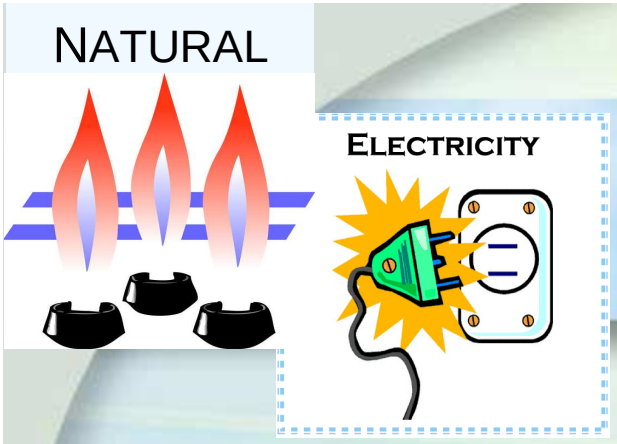


CEC, 2007 IEPR

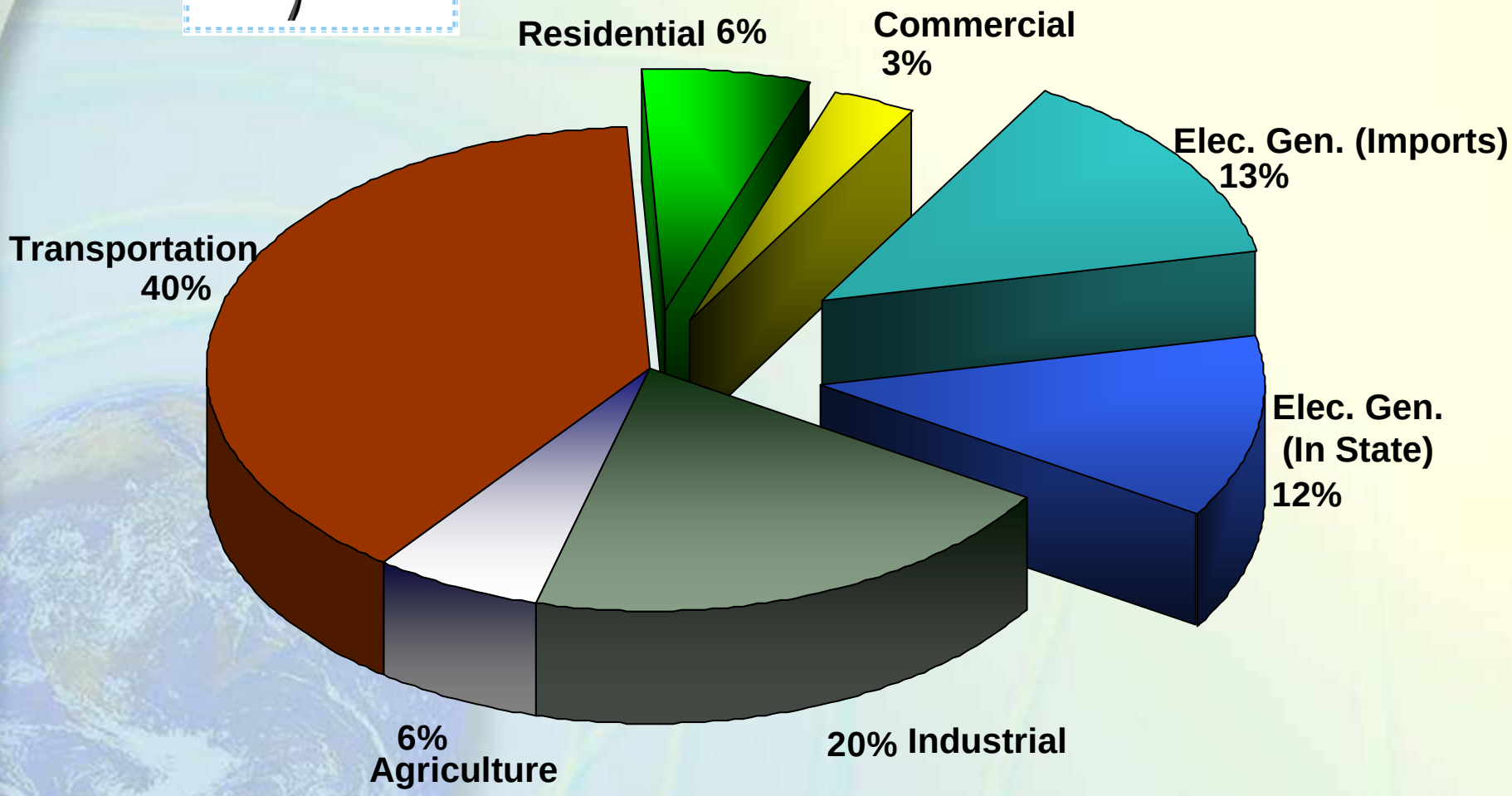


Emissions, Health, and Climate Change

- Power plant emissions contribute to ozone and particulate matter.
- State Implementation Plan (SIP) strategies will continue to reduce criteria pollutants and air toxic emissions
- Strategies to reduce GHG emissions from these sectors will also further reduce air pollutants



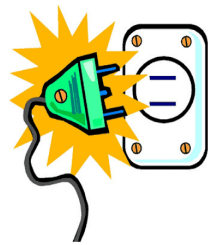
2004 GHG Emissions ($480 MMTCO_2E$)



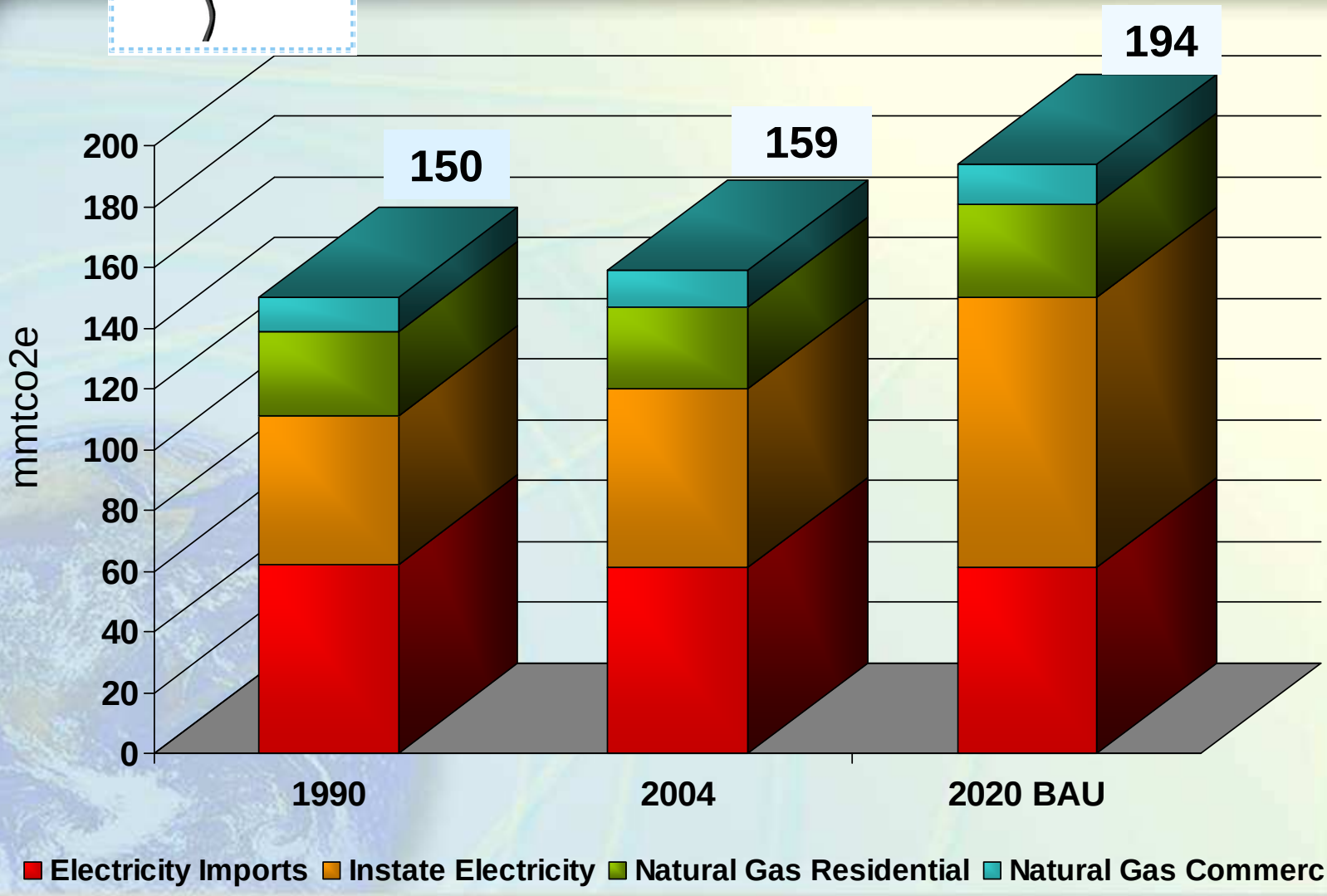
CARB 2007

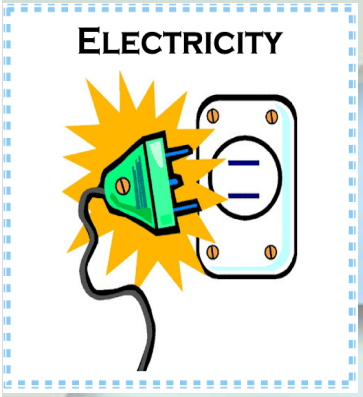
NATURAL

ELECTRICITY



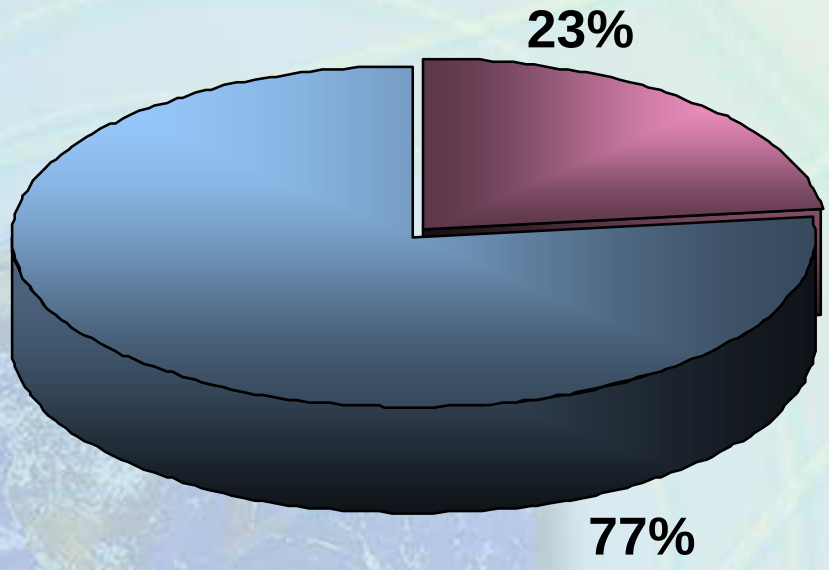
Emissions
(Natural Gas and Electricity)



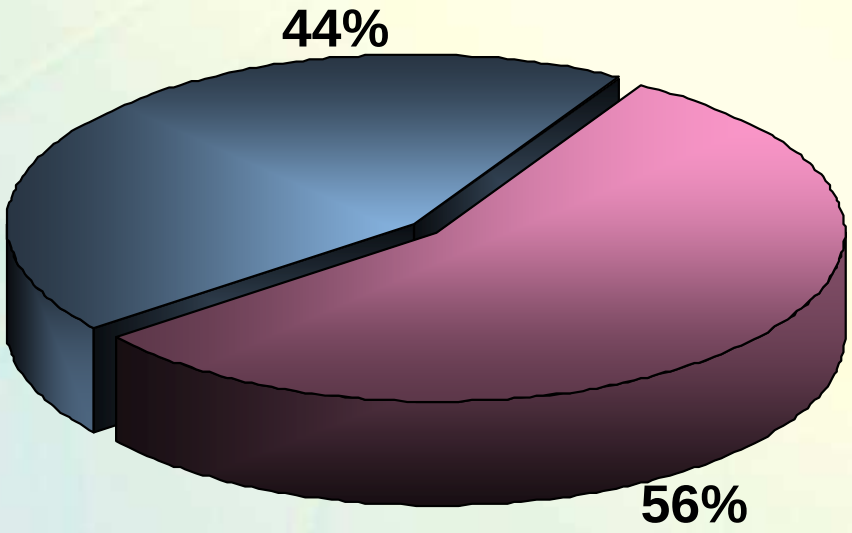


2004 Electricity-Related Emissions

Electricity Sales (MWh)



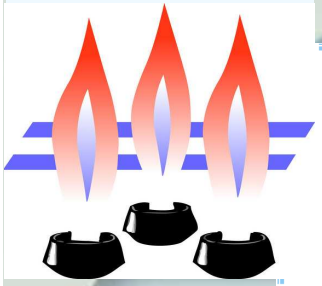
Emissions (mmtCO2e)



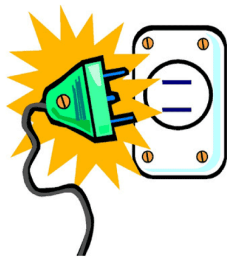
Imports In State

Source: CEC (for electricity sales); CARB (for emissions inventory)

NATURAL

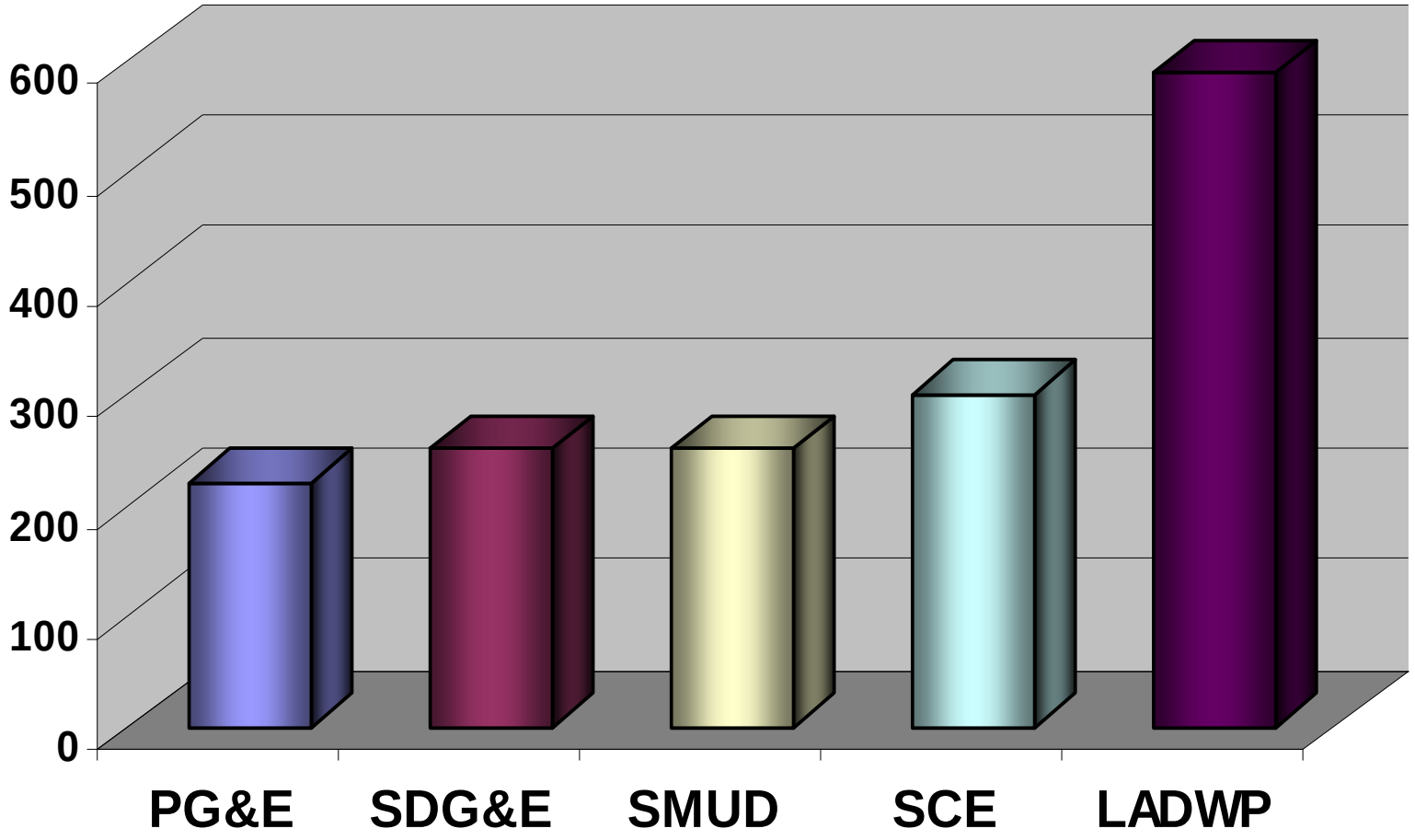


ELECTRICITY



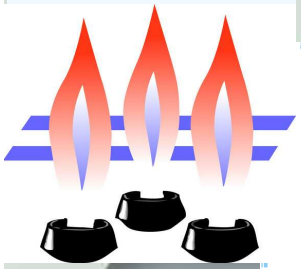
Emissions Intensity

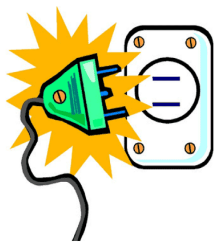
(Tons CO2e/GWh in 2005)



CPUC 2008

NATURAL





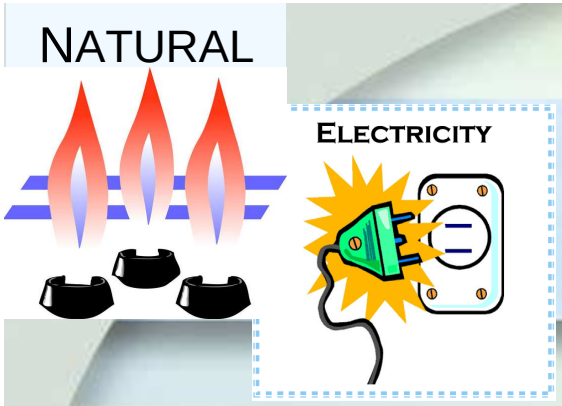
Starting Points For AB 32 Reductions

New Measures, Policies, Implementation Tools

GHG Reductions ≈ **Energy Efficiency** + **Renewable Energy** + **Emission Limits for Generators**

- CEC/PUC Policies & Standards
- AB 2021
- SB 1078
- RETI
- CA Solar Initiative
- SB 1368

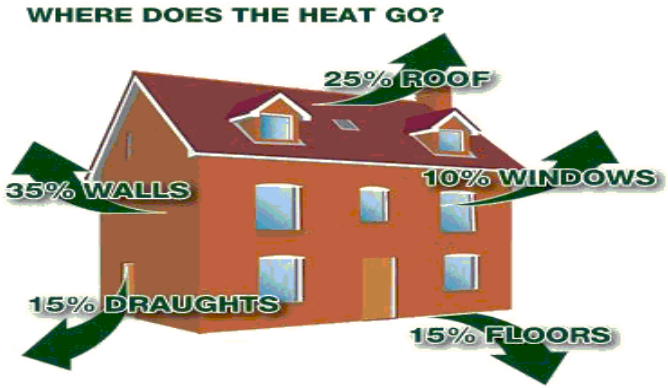
EXISTING REQUIREMENTS



Compliance Alternatives

- **Direct Regulation**
  - Command and control
  - Adopted policies
  - Performance standards
- **Market-Based Control Mechanisms**
  - Complements or supplements existing regulations and policies
  - Objective: to provide the greatest environmental benefit at the least cost

Energy Efficiency Concepts



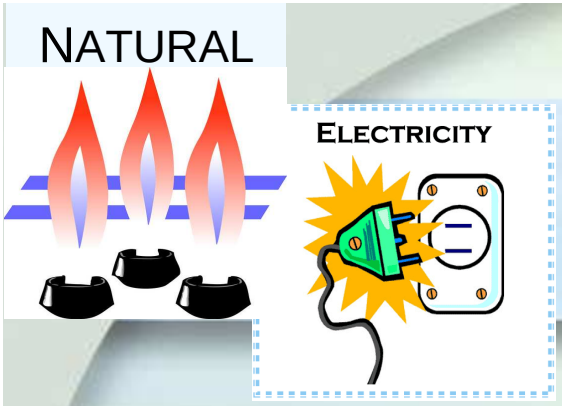
- **Updated Appliance and Building Standards**
- **Water and Energy Utility Partnerships**
  - Water conservation to reduce treatment and pumping
  - Energy efficient water pumps
- **Energy Efficiency Targets**
  - Broader penetration in commercial, industrial, and residential sectors
- **Smart Growth and Land Use Strategies**

Energy Generation Concepts

- **Renewable Generation**
  - Evaluate potential for greater generation from renewables
  - California Solar Initiative
    - Targets and manufacturer incentives
- **Conventional Generation**
  - Evaluate feasibility for updated Emissions Performance Standard
- **Distributed Generation/Cogeneration**
  - Self-Generation Incentive Program
    - Incentives to install clean distributed generation (e.g., fuel cells)
  - AB 1613 will encourage combined heat and power units under 20 megawatts

New Technologies

- **Research and Development**
  - Carbon capture and sequestration deployment
  - Improvements in green and renewable generation technologies and energy infrastructure
  - Bio-energy Action Plan to increase biomass in fuels by 2010 and 2020
  - Pursue ETAAC recommendations
- **Next Generation Standards**
  - Buildings, appliances, construction, engines
  - “Smart Grid” Technologies



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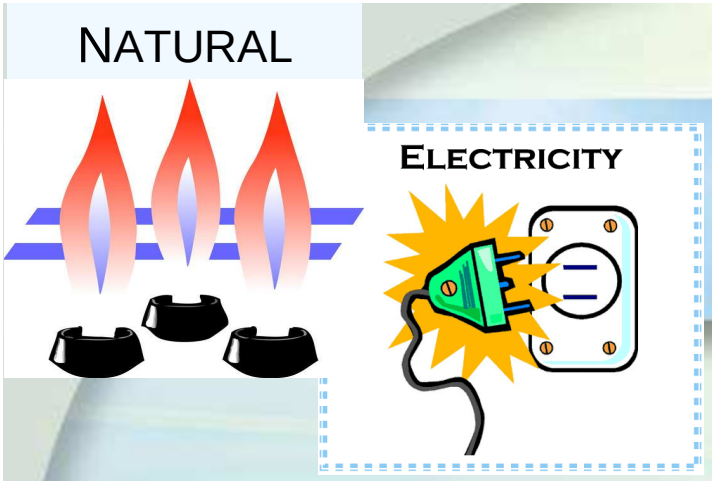
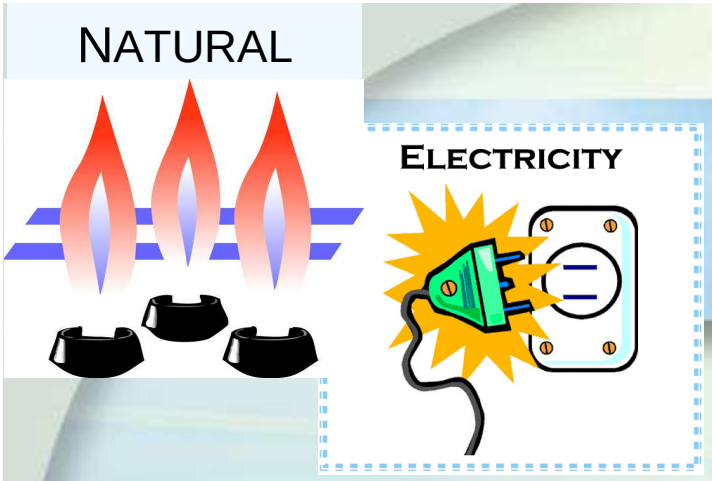


Market-Based Control Mechanisms

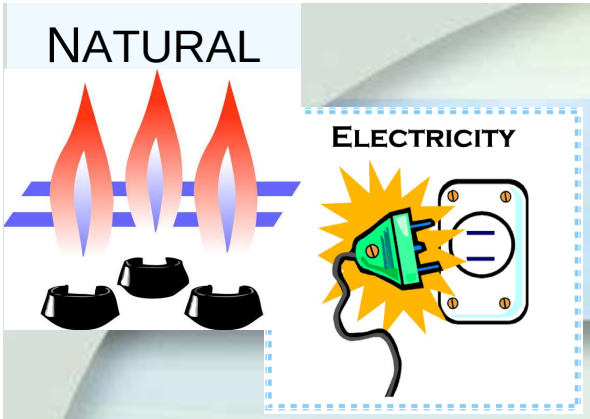
- **Market Incentives**
  - Rebates
  - "On Bill Financing"

- **Cap and Trade**
  - Set CO2 emissions cap over sectors (e.g., electricity, industry)
  - Cap declines over time
  - Auction/distribute emission allowances
  - Carbon price is set by market participants (*"points of regulation"*)
  - Emissions reductions (cap) is specified for the planning period (e.g., 2012-2020) – allows for long-term planning



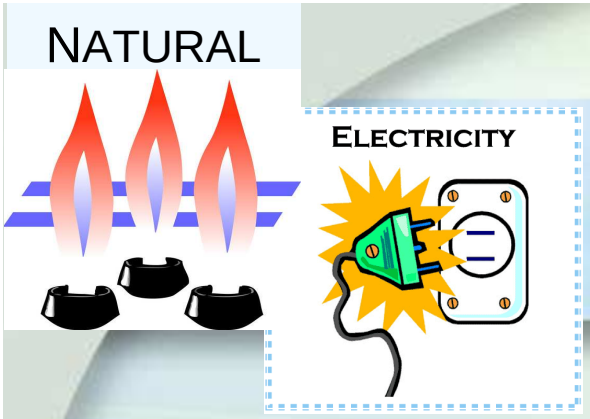
Electricity in Cap & Trade Programs

- The Electricity Sector plays a prominent role in cap & trade programs adopted elsewhere
  - European Union Emissions Trading Scheme
    - Included in a multi-sector economy wide cap & trade program
  - Regional Greenhouse Gas Initiative
    - Cap & Trade limited to the Electricity Sector on Northeast States
  - SO2 Acid Rain Program
    - Mandatory national cap & trade program for power plants
  - NOx/SOx RECLAIM Program
    - South Coast Air Quality Management District
    - Major industrial sources, including power plants



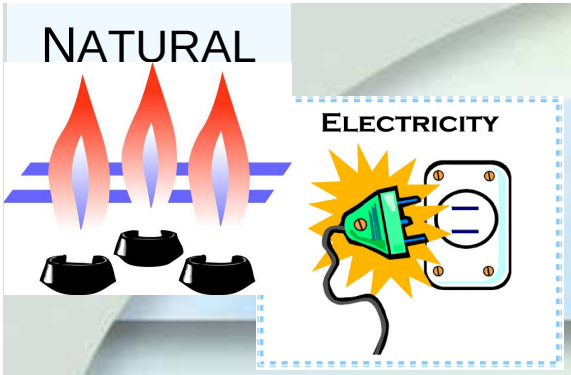
CPUC/CEC Role in the AB 32 Process

- AB 32 emphasizes a comprehensive, multi-sector approach to reduce greenhouse gases
- CPUC and CEC work closely with ARB
  - provide a unified programmatic approach to address AB 32 requirements for GHG reductions from electricity and natural gas sectors
- **March 2008 CPUC/CEC recommendations:** Policy principles on how best to integrate energy sector policies and standards into Scoping Plan strategies to meet the 2020 target



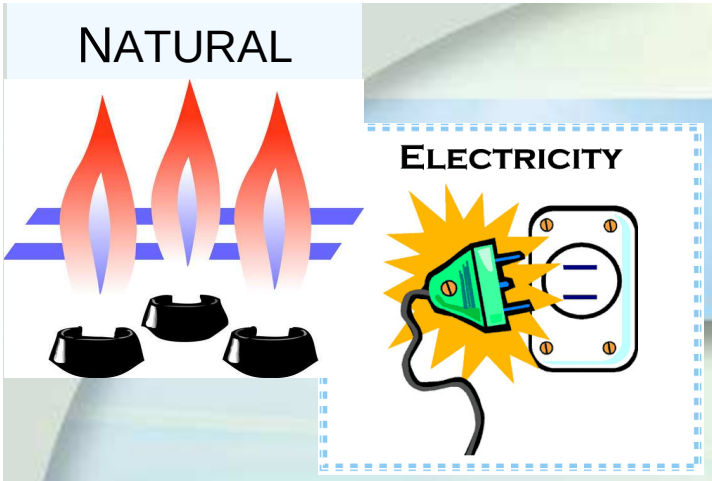
CEC/CPUC Recommendations: Mandatory Programs

- Require all “retail providers” of electricity and natural gas to achieve minimum levels of energy efficiency and renewable energy
- Require all retail providers to deliver cost-effective energy efficiency
- Require all retail providers to go beyond current 20% renewable portfolio standard



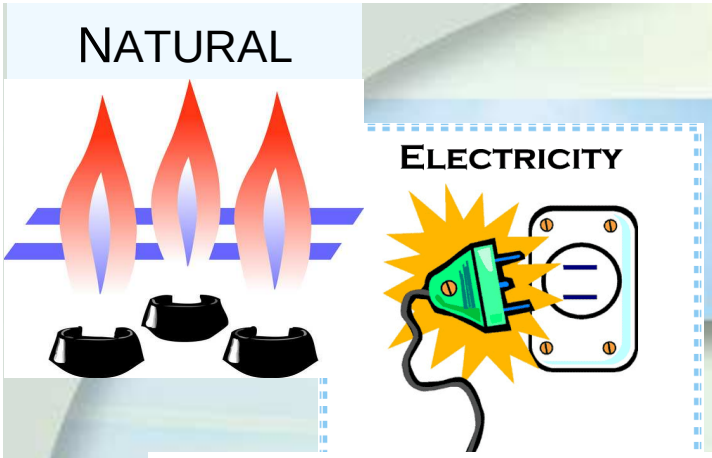
CEC/CPUC Recommendations: Cap-and-Trade

- **Delay inclusion of natural gas in a cap-and-trade approach**
  - Fewer options to reduce emissions in this sector
  - Decision should await emission calculation protocols for the local distribution company (retail provider) as the point of regulation
- **Integration of the electricity sector in a multi-sector cap and trade approach**
  - Within context of AB 32 requirements
- **Electricity "Deliverer" should be the point of regulation**
  - Entity that first delivers electricity onto the transmission grid in California
- **Auction some portion of allowances**
  - Higher prices for higher carbon intensity electricity (e.g., coal)
  - Rewards use of renewables and energy efficiency (the cleaner the electricity, the fewer allowances have to be purchased)
- **Distribute majority of auction revenues for benefit of consumers**



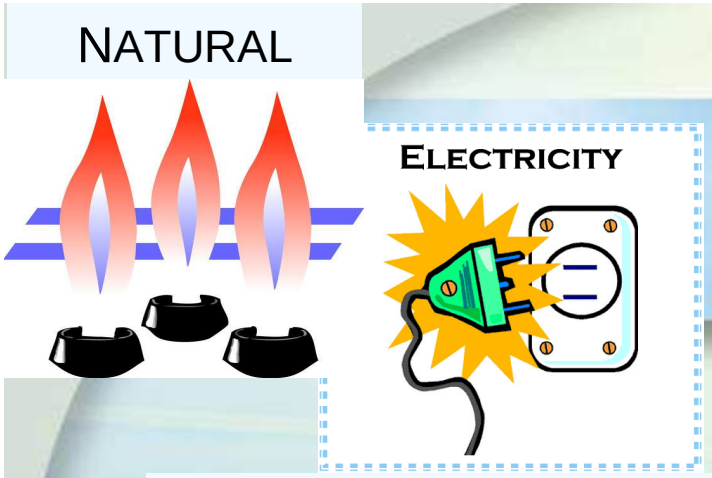
Reaction to Recommendations

- **Most parties in joint proceeding pleased with recommendations**
- **Two major areas of concern:**
  - Some publicly-owned utilities oppose auctioning of allowances, and desire an “opt out” of cap & trade system
  - Some comments that cap & trade recommendations were made without analysis of AB 32 requirements for market measures
- **CPUC/CEC continuing work**
  - Number of changes made to the final decision in response to comments
  - Work with ARB to ensure ultimate recommendation meets AB 32 tests
  - Current focus in joint proceeding on allowance allocation policy, taking into account equity considerations and impact on consumer costs



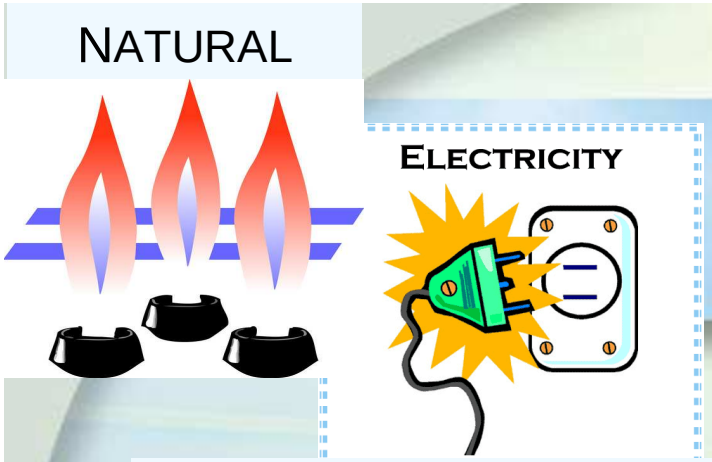
Summary

- **Considerations for greenhouse gas reductions from these sectors**
  - General agreement that we need additional regulations
  - By providing flexibility, cap and trade can achieve greater reductions at less societal cost than under direct regulations only
- **How we achieve emission reductions will affect choices and costs**
  - What sources will generate the power we use,
  - How much will we need,
  - What more can we do to be more energy efficient,
  - Which regulatory approaches can lead to the greatest environmental and public health benefits at the least cost



Key Events in 2008

- **May**
  - Scoping Plan workshop on economic modeling analysis
  - Board Workshop: Overview of major program design options for Scoping Plan
- **Late June**
  - Draft Scoping Plan release
- **July**
  - Scoping Plan Workshops throughout the State
- **August**
  - CPUC/CEC comprehensive policy recommendations
- **November**
  - Consideration of Scoping Plan adoption



Continuing Efforts

- **Interagency Coordination**
  - Cal/EPA and Energy Climate Action Team
- **Western Climate Initiative**
  - Any agreement by California will be in the context of applicable AB 32 and CEC/CPUC policies
- **Federal Legislation**
  - Staff is tracking bills in Congress
  - Legislation a possibility within 24 months
- **Socio-economic Assessments/Modeling**
- **Outreach**